

Docket 82897A/CPK
Customer No. 01333

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of
Xiaoru Wang, et al.

INK COMPOSITION

Serial No. 10/686,825

Filed October 16, 2003

Group Art Unit: 1714

Examiner: Callie E. Shosho

Sir:

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37 and 35 U.S.C. 134

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APPELLANT'S BRIEF ON APPEAL

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the Examiner's Final Rejection of claims 1, 2, 4-7, and 9-15 which was contained in the Office Action mailed August 28, 2006.

A timely Notice of Appeal was filed November 28, 2006.

Real Party In Interest

As indicated above in the caption of the Brief, the Eastman Kodak Company is the real party in interest.

Related Appeals And Interferences

No appeals or interferences are known which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

Status Of The Claims

Claims 1, 2, 4-7, and 9-15, all the claims presently pending, have been finally rejected on August 28, 2006 and are appealed.

Appendix I provides a clean, double spaced copy of the claims on appeal.

Status Of Amendments

No amendments have been filed subsequent to the final rejection. All previous amendments have been entered, namely Applicants' amendments of June 1, 2006 which were made prior to final rejection and duly entered.

Summary of Claimed Subject Matter

The present invention is defined in two different ways. As stated in the first independent claim (claim 1) and as described on page 2 of the specification, the invention is directed to an organic solvent based ink composition comprising more than 60 % by weight of an organic solvent and composite colorant polymer particles, wherein the composite colorant polymer particles have a pigment colorant phase and a polymer phase, wherein the polymer phase of the particles is formed in situ in the presence of the pigment colorant. Furthermore, the

composite colorant polymer particles have a mean particle size of less than about 200 nm.

The second independent claim (claim 15) as also described on page 3 of the specification, in addition to the requirement of claim 1, further requires that the composite colorant polymer particles are made by a process comprising, in order:

I) suspending in an aqueous medium, under agitation, finely divided colorant particles to form an aqueous colorant mixture;

II) adding to said aqueous colorant mixture an addition polymerization initiator before introducing a monomer mixture used to form the polymer phase; and

III) causing said addition polymerization initiator to form a free radical while continuously introducing to said aqueous colorant mixture the monomer mixture comprising:

a) an addition polymerization initiator, and

b) at least one ethylenically-unsaturated monomer;

thereby forming said composite colorant particles having a colorant phase and a polymer phase.

Grounds of Rejection to be Reviewed on Appeal

The following issues are presented for review by the Board of Patent Appeals and Interferences:

1. Are claims 1-2, 5-7, 9-10, and 12-15 unpatentable under 35 U.S.C. §103(a) over Ishii et al. Sub-issues of Issue 1 are as follows:

- (a) Can the product-by-process limitations of the claimed invention, including the requirement of *in-situ* formation, be ignored in the absence of additional factual evidence with respect to the cited prior art?
- (b) Does the product disclosed in Ishii et al. reasonably appear to be either identical with or slightly different from the product

claimed in the present application? Has the Examiner satisfied the requirement of making a *prima facie* case of obviousness?

Arguments

It is the conclusion of the Examiner that it "...would have been obvious to one of ordinary skill in the art to use composite colorant polymer particles in Ishii et al. with mean particle size, including that presently claimed, in order to produce ink that will not clog the printer nozzles, and thereby arrive at the claimed invention."

Applicants' position is that this rejection is unsupported by the relevant facts for the following reasons. The purpose of the colorant particles of Ishii et al. is to agglomerate in an electrostatic inkjet system, whereas the purpose of the present colorant particles is to avoid agglomeration in a thermal inkjet recording system. Ishii et al. state, in column 6, lines 46-58, as follows:

...The agglomerates of the colored particles are formed at the jetting position by impressing a strong electrical field on the oil ink at the jetting position, and the agglomerates are ejected from the jetting position by electrostatic means. The colored particles are thus ejected as highly concentrated agglomerates....

The Examiner referred to column 21 of Ishii et al., wherein it is stated as follows:

...the colored particles may be contained in resin particles for dispersion for the purpose of improving fixing property. When the colored particles are contained in resin particles for dispersion, pigments are generally covered with the resin material of the resin particles for dispersion to make resin covered particles.... [Emphasis added]

Thus, Ishii et al. teach encapsulating each pigment particle with already formed resin particles. In contrast, the present invention is directed to colorant particles that have a pigment phase and a polymer

phase, the polymer phase being formed in situ in the presence of the colorant (claim 1). This in situ formation is further detailed in claims 2 and 15. It is respectfully submitted that the rejection improperly reads in situ formation into Ishii et al. based entirely on Applicants' own disclosure.

The Examiner, in the final rejection, does concede that Ishii et al. does not disclose the process of present claim 2 or 15, but improperly ignores those process limitations, i.e. product-by-process limitation. The Examiner states "If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

The Applicants' position is that one of ordinary skill in the art would readily appreciate that the present product is indeed different and non-obvious from the product of Ishii et al., based on their different methods of preparation, which is the key aspect of the invention, resulting in superior stability of the claimed product as shown by the experimental evidence in Table 2 of the present application.

With respect to the present product-by-process limitation involving in-situ formation of the polymer phase in the presence of the colorant, Applicants respectfully submit that the Examiner has not satisfied the Examiner's burden of proof in making out a *prima facie* case of obviousness under Ex parte Kung, 17 USPQ2d 1545, 1548 (Bd. Pat. App. & Int'f 1990; or In re Brown, 173 USPQ 685, 688 (CCPA 1972). It is incumbent on the Examiner to establish that the prior art discloses a product which reasonably appears to be either identical with or only slightly different than the product claimed in the present product-by-process claim. [Emphasis added]; "it is incumbent upon the examiner to advance evidence that the [reference] appears to be identical or only slightly different than the claimed [invention] that is produced by the recited process," Ex parte Kung, *supra*. It is submitted that one of ordinary skill in the art would recognize that the presently claimed inkjet ink composition would perform differently with respect to the various performance properties relevant to an inkjet ink composition,

including stability and dispersion characteristics, properties mentioned or tested in the present application.

Importantly, it would be plainly obvious to the skilled artisan that the in-situ formation of the polymer phase of the composite colorant particles in the presence of the colorant would, in fact, have a different structure than the aggregates of Ishii et al., as could be observed under an electron microscope or similar analytical technique. For example, Ishii et al. teaches aggregating already formed polymer particles over a colorant, which is theoretically observable, whereas it would be theoretically observable that the pigment colorant of the present particles will not be covered by previously formed separate polymer particles, but rather will have attached polymers formed in-situ in the presence of the pigment colorant. This structural difference could be easily observed, for example, by making a cross-section of the particles and examining it under an electron microscope. Thus, the structure of the composite or colored particles would reflect whether the particles were consistent with being made by the process of Ishii et al. or with Applicants' invention.

Moreover, the Examiner's requirement that the Applicants "come forward with evidence establishing an unobvious difference between the claimed product and the prior art product," even assuming *arguendo* that Applicants have that burden, makes no sense, since it would involve the Applicants making colored particles based on the disclosure of Ishii et al. and Ishii et al. provides no example or instructions on how to make such a colored particles, other than some vague general description. Thus, there is no clear prior art product for comparison. For example, Ishii et al. do not state exactly how their colored polymer particles are made or a particular composition for such colored polymer particles.

Hence, the Examiner has not pointed to any prior art product that Applicants should compare to the present invention. Moreover, the additional evidence demanded by the Examiner represents an unreasonable and unjustified burden, since the inventors are currently working on a different project. In any case, Applicants have no assurance that any particular experiment that the Applicant devised in good faith would sufficiently satisfy the Examiner's indefinite request for evidence or prevent the Examiner from switching to a

different prior art reference, and arbitrarily demanding further factual evidence. Thus, the Applicants do not consider the Examiner's arbitrary suggestion that Applicants duplicate an unknown composition based on vague language in Ishii et al. and to compare it to the present invention, by carrying out expensive and inconvenient experiments of questionable necessity to be a reasonable or justified request.

Finally, the Examiner has not give proper weight to the evidence of comparative properties shown in Table 2 of the specification. In fact, the Applicants have shown that the process limitations at issue in the product-by-process claims clearly effect important properties of the composite colorant particles in the ink, as a clear reflection of the underlying structure. In particular, Applicants have shown, with respect to Control C-3 in Table 2, that a deviation from the process of the present invention results in significantly greater particle aggregation.

With respect to claim 12, the presently claimed *in-situ*-formed polymer phase of the composite colorant particles must also be less than 80 nm, as supported by numerous examples of colorant particles having a particle size of 41 to 45 nm. Although the Examiner states that the polymer particles of Ishii et al. (which are not *in-situ*-formed) are 100-1500 nm, the Examples are 230 nm, in which the polymer particles did not contain any pigment or other colorant. The Examiner contends that one of ordinary skill would "recognize that the mean particle size of the colored polymer particles must be small enough so that the colored polymer particles do not flocculate or aggregate and cause clogging of printer nozzles." However, although the skilled artisan might recognize that more fully based on Applicants' own disclosure, the skilled artisan would actually recognize, based on a fair reading of the disclosure of Ishii et al., that aggregation of the particles would be desirable.

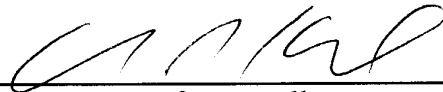
Summary

In view thereof, it follows that the subject matter of the claims would not have been obvious over Ishii et al. under 35 U.S.C. §103(a) at the time the invention was made.

Conclusion

For the above reasons, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the rejection by the Examiner and mandate the allowance of Claims .

Respectfully submitted,



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Enclosures

If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Appendix I - Claims on Appeal

1. (Previously presented) An organic solvent based ink composition comprising more than 60 % by weight of an organic solvent and composite colorant polymer particles, wherein said composite colorant polymer particles have a colorant phase, which comprises pigment, and a polymer phase, said polymer phase of said particles being formed in situ in the presence of said colorant, said composite colorant polymer particles having a mean particle size of less than about 200 nm.

2. (Previously Presented) The composition of Claim 1 wherein said composite colorant polymer particles are made by a process comprising, in order:

I) suspending in an aqueous medium, under agitation, finely divided colorant particles to form an aqueous colorant mixture;

II) adding to said aqueous colorant mixture an addition polymerization initiator before introducing a monomer mixture used to form the polymer phase; and

III) causing said addition polymerization initiator to form a free radical while continuously introducing to said aqueous colorant mixture a monomer mixture comprising:

a) an addition polymerization initiator, and

b) at least one ethylenically-unsaturated monomer;

thereby forming said composite colorant particles having a colorant phase and a polymer phase.

3. (Canceled)

4. (Previously Presented) The composition of Claim 1 wherein said pigment is C.I. Pigment Blue 15:3, C.I. Pigment Red 122, C.I. Pigment Yellow 155 or C.I. Pigment Black 7.

5. (Original) The composition of Claim 1 wherein the composite colorant particles comprise up to about 20% by weight of said composition.

6. (Original) The composition of Claim 1 wherein the composite colorant particles comprise up to about 10% by weight of said composition.

7. (Original) The composition of Claim 1 wherein said organic solvent is a mineral oil, soybean oil, toluene, ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, tetraethylene glycol, polyethylene glycol, glycerol, poly(ethylene glycol) monobutyl ether, diethylene glycol monobutyl ether, xylene, kerosene, naphthalene or liquid paraffin.

8. (cancelled)

9. (Original) The composition of Claim 1 wherein said polymer phase comprises a polymer formed from methyl methacrylate, ethyl methacrylate, butyl methacrylate, ethyl acrylate, butyl acrylate, hexyl acrylate, n-octyl acrylate, lauryl methacrylate, 2-ethylhexyl methacrylate, nonyl acrylate, benzyl methacrylate, 2-hydroxypropyl methacrylate, acrylonitrile, methacrylonitrile, vinyl acetate, vinyl propionate, vinylidene chloride, vinyl chloride, styrene, t-butyl styrene, vinyl toluene, butadiene, isoprene, N,N-dimethyl acrylamide, acrylic acid, methacrylic acid, chloromethacrylic acid, maleic acid, allylamine, N,N-diethylallylamine, vinyl sulfonamide, ammonium acrylate, ammonium methacrylate, acrylamidopropane-triethylammonium chloride, methacrylamidopropane-triethylammonium chloride, or vinyl-pyridine hydrochloride.

10. (Original) The composition of Claim 1 wherein said composite colorant polymer particles have a mean particle size of less than about 80 nm.

11. (Original) The composition of Claim 1 wherein said polymer phase is cross-linked.

12. (Original) The composition of Claim 1 wherein said colorant phase of said composite colorant particles has a mean size of less than about 80 nm and said polymer phase has a weight average molecular weight of greater than about 5000.

13. (Original) The composition of Claim 1 wherein said polymer phase has a weight average molecular weight of greater than about 10,000.

14. (Original) The composition of Claim 1 wherein the ratio of said colorant phase to said polymer phase is from about 30:70 to about 70:30.

15. (Previously Presented) An organic solvent based ink composition comprising more than 60 % by weight of an organic solvent and composite colorant polymer particles, wherein said composite colorant polymer particles have a colorant phase, which comprises pigment, and a polymer phase, said polymer phase of said particles being formed in situ in the presence of said colorant, said composite colorant polymer particles having a mean particle size of less than about 200 nm, wherein said composite colorant polymer particles are made by a process comprising, in order:

I) suspending in an aqueous medium, under agitation, finely divided colorant particles to form an aqueous colorant mixture;

II) adding to said aqueous colorant mixture an addition polymerization initiator before introducing a monomer mixture used to form the polymer phase; and

III) causing said addition polymerization initiator to form a free radical while continuously introducing to said aqueous colorant mixture the monomer mixture comprising:

a) an addition polymerization initiator, and

b) at least one ethylenically-unsaturated monomer;
thereby forming said composite colorant particles having a colorant
phase and a polymer phase.

Appendix II - Evidence

None.

Appendix III – Related Proceedings

Not Applicable.